NJDHSS General Guidelines for Surveillance and Epidemiologic Activities Related to Emerging Infections or Bioterrorism (BT) Events

Introduction

NJDHSS and its regional public health and healthcare partners have had much recent experience with public health emergencies. These emergencies have included the introduction of naturally-occurring emerging infectious diseases (e.g., West Nile virus in 1999 to the present and SARS in 2002) as well as a bioterrorist-event involving anthrax cases associated with *Bacillus anthracis*-contaminated letters in 2001. Although the pathophysiology and epidemiology of specific communicable diseases might be different, the approaches to handling these diseases in emergency situations are the same, based on NJDHSS's previous experiences.

The guidelines below provide general guidance for approaching any event involving a naturally-occurring emerging infection or BT event and are divided into the following sections:

- Objectives
- Expectations
- Surveillance activities
    - Active healthcare facility-based surveillance
    - Enhanced passive surveillance
- Immediate epidemiologic activities
- Data management and maintenance
- Public health control activities
- Other related areas
- Resources

Public health surveillance systems should consider system attributes, including simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability.[1] However, public health officials face the challenging task of balancing these considerations with the realities of modifying surveillance and epidemiologic activities during crises to balance disease containment and resource sustainability.

[1] CDC. Updated guidelines for evaluating public health surveillance systems. *MMWR* 2001: 50(RR13);1-35. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm.

Objectives

NJDHSS, in collaboration with regional public health and healthcare partners, developed these guidelines to address the following objectives:

- Identify reports of suspect illness related to a BT event or an emerging infectious disease
- Ensure appropriate epidemiologic actions necessary to determine case status of reports
- Maintain/manage/analyze data on reports to characterize scope/magnitude of outbreak/incident
- Define and clarify roles in epidemiologic and surveillance activities
- Implement appropriate public health control activities to limit spread of illness (e.g., contact tracing and management, isolation, quarantine)
- Enhance regional communications with public health partners, the healthcare community (e.g., hospitals, providers) and non-traditional partners (e.g., law enforcement, veterinarians)
- Preserve the welfare and safety of public health, healthcare and non-traditional partners participating in response activities

Expectations

To meet the objectives of these guidelines, public health and healthcare partners must work collaboratively and also understand the overall functions expected of them.

Expectations of

- NJDHSS: resource and technical support for all surveillance and epidemiologic efforts; central data repository and statewide data analysis
- Regional public health partners: implementation of all surveillance activities, local leadership in epidemiologic investigations and public health control measures
- Healthcare community: participation in active and enhanced passive surveillance activities, cooperation with regional public health partners and NJDHSS

Surveillance activities

Surveillance is the ongoing and systematic collection of data, which is vital for identifying and characterizing emerging infections or BT events. Active surveillance involves public health entities requesting data on a regular basis from the healthcare community. Passive surveillance relies on the healthcare community to report notifiable conditions to public health entities, as they occur.

Surveillance activities require retrospective and prospective data review. Public health will define the extent of retrospective review based on known epidemiologic features of the first identified illnesses, accounting for factors such as disease incubation period and possible periods of exposure. Because retrospective review might challenge existing resources, public health agencies might prioritize retrospective review for persons currently hospitalized. Prospective surveillance begins from the point an emerging infectious disease or BT-related illness is identified and continues until surveillance data demonstrates no additional disease activity.

Once an emerging infectious disease or BT-related illness is identified, public health and healthcare partners must implement both active and passive surveillance activities and incorporate components of both retrospective and prospective data review. *Implementation of all these elements will increase the overall sensitivity of surveillance activities, therefore ensuring optimal efforts to capture all cases of an emerging infectious or BT-related disease*.

Active healthcare facility-based surveillance

- Healthcare facility identification
    - NJDHSS will obtain a list of NJ hospitals from NJHA and review this list with regional epidemiologists
    - NJDHSS will obtain list of Centers for Primary Health Care, long-term care facilities and specialty hospitals (e.g., Veteran's Affairs)
    - NJDHSS will obtain contacts of MSNJ, APIC, IDSA-NJ and other professional organizations; regional epidemiologists will identify private practitioners in their jurisdictions
- Participation strategies
    - Letter from State Epidemiologist requesting healthcare facility participation
    - Define start date/time to begin surveillance activities
    - Define when (i.e., frequency) and what to report
    - Define to whom healthcare facilities need to report (e.g., regional public health officials)
- Data collection issues
    - Development of case-finding definition
    - Data intake forms for suspect BT-related reports
    - Daily summary reports, including "zero reports"

    - ICPs or healthcare facilities points-of-contact need to be liaison to their laboratories
- Distribution of information, letters and forms to targeted surveillance partners
    - Messages through LINCS (HAN Communicator) and NJHA
    - Phone conferences
    - Regional epidemiologists
    - Website postings
    - 800 megaHz radio transmissions to hospitals
    - "Blast" faxes
- Coordination/logistics
    - Initial conference call with regional epidemiologists to describe surveillance operations
    - Regional epidemiologists will coordinate surveillance activities with their respective healthcare communities
    - Regional epidemiologists collect surveillance data from healthcare facilities and providers in their jurisdictions; regional epidemiologists then provide data to NJDHSS
    - Follow-up conference calls (daily) with regional epidemiologists for feedback on surveillance activities, verification of data, and sharing of information
    - Modification of surveillance methodologies as needed, based on regional epidemiologists' feedback and surveillance findings—e.g., When do we change case finding definition? When do we truncate data collection?
    - Regional epidemiologists will communicate information on surveillance activities to their respective LINCS agencies and local health departments

Enhanced passive surveillance

- Widely distribute case finding definition
    - Professional organizations (e.g., NJHA, APIC, MSNJ, IDSA-NJ)
    - Websites
    - Press releases
    - NJLINCS
- Receive reports from healthcare providers/facilities

Immediate epidemiologic activities

Epidemiology is the study of the distribution and determinants of health or disease in a population and the application of this study to control of health problems. In the context of emerging infectious diseases or BT-related events, epidemiologic activities rely on information from active and passive surveillance as well as information from interviews of case-patients and their contacts. Public health and healthcare partners might begin initial epidemiologic activities without any clear hypotheses and might also need to implement immediate control measures to curb disease spread. Therefore, public health and healthcare partners must acknowledge and appreciate the need to balance possible limitations in investigations (i.e., making judgment calls on when data are sufficient to take public health actions) with the imperatives of timely public health interventions.

Regional epidemiologists, in coordination with their regional health officers, need to serve as conduits of information between the healthcare community and NJDHSS. To optimize information flow regarding appropriate review of case-patient information, NJDHSS clinical staff might need to directly communicate with healthcare providers.

The following list outlines some initial field and descriptive epidemiologic activities that public health and healthcare partners need to implement promptly, once an emerging infection or BT-related event is identified.

- Develop case definition for report categorization– "confirmed," "probable," "suspect" and "not a case"
- Review and follow-up of reports obtained through active and enhanced passive surveillance
    - Identification of likely exposures; "trace-backs"
    - Categorization to "confirmed," "probable," "suspect" and "not a case"
    - Identification and management of case-patients' contacts and population at-risk, based on likely exposures
- NJDHSS surveillance team to triage reports received from regional epidemiologists and healthcare community
    - Determine which reports need additional follow-up by NJDHSS clinical investigations team
    - Track/manage all reports sent in by regional epidemiologists and healthcare community
- NJDHSS clinical investigations team obtains additional info on suspect reports; provides infection control/clinical guidance as needed
- Healthcare facilities/regional epidemiologists to work through NJDHSS surveillance and clinical investigations teams to coordinate clinical specimen testing at NJPHEL
- Regional epidemiologists to coordinate and report friend/family/work contacts of case-patients
    - Confirm associations with case-patients
    - Determine presence/absence of symptoms
    - Offer antimicrobial prophylaxis

    - Monitor health status
- Healthcare facilities (e.g., ICPs, DONs) to identify and manage healthcare-associated contacts (i.e., occupational exposure) of case-patients
    - Regional epidemiologists will work with ICPs in healthcare facilities to establish contact management procedures
- Identification/management of population-at-risk, based on likely exposures
- Description of characteristics and extent of outbreak
    - Identification of unusual disease presentation
    - Morbidity and mortality
    - Incubation period and transmission
    - Presence of antimicrobial resistance
- Determination of any unusual features of illness that might require case definition modifications
- ***NJDHSS, public health partners and the healthcare community will need to modify case finding, contact management and other activities because of anticipated dwindling resources, especially in large-scale public health emergencies → need to strike balance between disease containment and resource sustainability***

Data management and maintenance

Analysis of data from surveillance and epidemiologic activities provides information needed to describe emerging infections and BT-related events. However, public health and healthcare partners must maintain and manage these data to optimize their quality, validity and usefulness.

- NJDHSS will maintain centralized data and provide overall state numbers ("official" numbers); will utilize and adapt existing systems (e.g., CDRS) currently available statewide
- NJDHSS will provided regular summary reports at state level for internal, regional and media use, including:
    - Case counts by category, county
    - Epicurve
- NJDHSS will outline standardized methods to receive data from regional public health and healthcare partners
- NJDHSS will perform data cleaning and backup
    - Paper record keeping
    - Emergency contingency plans
    - Electronic backup of data (e.g., CD-R, flash drive, secure network)
- Regional epidemiologists will maintain data on contacts of case-patients

Public health control activities

Surveillance and epidemiologic activities provide information to guide timely and appropriate public health control activities to contain identified sources of disease and to prevent possible development of disease. The following list describes some public health control strategies.

- Contact tracing and management: described above, in "Immediate epidemiologic activities" section
- Isolation[2]:
  - Guidelines for acute-care hospitals, subacute/extended care facilities
  - Rationale for isolation precautions based on source of infectious organisms, susceptible hosts and means of transmission for organisms
- Quarantine[3]:
  - May be individual, population-specific or geographic
  - Statutory authority in N.J.S.A. 26:4-2 granted to NJDHSS and local boards of health including power to:
    - Maintain and enforce proper and sufficient quarantine when deemed necessary
    - Remove any person, animal or article infected with communicable disease to suitable place
  - Adequate food, clothing, medication, means of communication and other necessities and competent medical care shall be provided by local resources
  - Health status of quarantined persons must be monitored regularly by local resources to determine if status changes
- Post-exposure prophylaxis (e.g., vaccinations, antibiotics)
  - Identification of individuals requiring prophylaxis
    - Contacts of case-patients
    - At-risk population (i.e., persons with similar risk factors/exposures as known case-patients)
  - In the event of large-scale emerging infectious disease or BT-related events, regional health departments might need to operate points of dispensing clinics to facilitate mass vaccinations or mass antibiotic prophylaxis
- Health education and training
  - Training of public health staff to implement appropriate control activities
  - Education of general public and healthcare community through multimedia approaches (e.g., public service announcements, press releases, posters, brochures, fact sheets)
  - Distribution of educational materials

---

[2] Isolation: separation and restriction of movement of persons with specific infectious illness from those who are healthy

[3] Quarantine: separation and restriction of movement of persons who have been exposed to infectious agent (might become infectious) and who are not ill

Other related areas

These guidelines primarily serve to outline general strategies for surveillance and epidemiologic activities related to emerging infections or BT-related events. However, these activities might be extremely resource-consuming and distracting for public health and healthcare partners from their usual responsibilities. To this end, NJDHSS reminds regional public health and healthcare agencies to consider two other vital areas, business continuity and communications. Agencies must ensure they have appropriate and adequate staff to accommodate routine work. Also, agencies should consider developing communications protocols to ensure information flows smoothly, both within and outside of their respective agencies.

Resources

NJDHSS Communicable Disease Service
Monday-Friday, 8am-5pm: 609-588-7500, 609-588-3121
Weekends/holidays/off-hours: 609-392-2020

NJDHSS Influenza Pandemic Plan. Available at:
http://www.state.nj.us/health/cd/influpandplan.pdf.

NJDHSS SARS Preparedness and Response Plan. Available at:
http://www.state.nj.us/health/er/sarsplan021804.pdf.

NJDHSS Smallpox Vaccination Plan. Available at:
http://www.state.nj.us/health/er/smallpoxvacplan.pdf.

Bednarczyk M, Liu S, Tan C, Bresnitz E. An overview of communicable disease surveillance activities in New Jersey. *NJ Med* 2004;101(9): 45-52.

Greene C, Reefhuis J, Tan CG, Fiore AE, Goldstein S, Beach M, Redd S, Valiante D, Burr G, Buehler J, Pinner R, Bresnitz E, Bell B, and the CDC New Jersey Anthrax Investigation Team. Epidemiologic investigations of bioterrorism-related anthrax, New Jersey, 2001. *Emerg Infect Dis* 2002; 8(10): 1048-1055. Available at:
http://www.cdc.gov/ncidod/EID/vol8no10/02-0329.htm.

Tan CG, Sandhu H, Crawford D, the Regional Anthrax Surveillance Team, Redd S, Beach M, Buehler J, Bresnitz E, Pinner R, Bell BP, and the CDC New Jersey Anthrax Surveillance Team. Surveillance for anthrax cases associated with anthrax contaminated letters—New Jersey, Pennsylvania, and Delaware, 2001. *Emerg Infect Dis* 2002; 8(10): 1073-1077. Available at: http://www.cdc.gov/ncidod/EID/vol8no10/02-0322.htm.